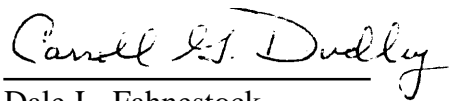


MEMORANDUM OF AGREEMENT (MOA)
BETWEEN THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S (NASA)
GODDARD SPACE FLIGHT CENTER (GSFC)
AND THE
DRYDEN FLIGHT RESEARCH CENTER (DFRC)
FOR PROVIDING
TRACKING AND DATA ACQUISITION (T&DA) NETWORK SUPPORT
TO THE
SPACE SHUTTLE PROGRAM (SSP)

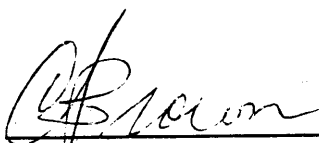
APPROVED:



Dale L. Fahnestock
Director, Mission Operations
and Data Systems/500
Goddard Space Flight Center

4-11-95
Date

APPROVED:



Charles A. Brown
Director, Research Facilities
Dryden Flight Research Center

3/28/95
Date

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S (NASA)
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FOR PROVIDING
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TO THE
SPACE SHUTTLE PROGRAM (SSP)

1. PURPOSE

This MOA defines the roles and responsibilities of GSFC and DFRC for the acquisition and exchange of data in providing network support to SSP.

2. AUTHORITY

The support included in this Agreement is to be provided under the general provisions of the T&DA concept defined in the following NASA Management Instructions (NMI's):

- a. Obtaining Use of Office of Space Communications (OSC) Capabilities for Space, Suborbital and Aeronautical Missions, NMI 8430.IC, dated 12/19/91 (expiration **12/19/95**).
- b. Management of operational Support Requirements for Manned Flight Missions, NMI 8610.10B, dated 12/31/91 (expiration 12/31/95).

3. **GENERAL**

GSFC is the NASA center responsible for the overall T&DA Network support of SSP. DFRC is an integral part of the T&DA Network supporting SSP. Based on SSP

requirements documents, SSP manifests, NASA Program Plans, Network Operations Support Plans, and other network operations support documents, DFRC will be required to provide UHF Air-to-Ground (A/G) voice, C-band radar metric data, S-band uplink and downlink support, and video (television) support to the SSP.

To satisfy the DFRC uplink support requirements, GSFC has provided DFRC with a Network-compatible Shuttle S-band Forward Link (SFL), Communications Data Formatter (CDF), NASA Communications Network (Nascom) support resources, and a unique S-band exciter and transmitter.

4. APPLICABLE DOCUMENTS

The latest version of the following documents are applicable to the mission planning, pre-mission, and post-mission support of the Space Shuttle:

- a. Network Operations Support Plan for the Space Shuttle Program, 501-601/Space Shuttle.
- b. Network Operations Directive for the Space Shuttle Operational Phase, 501-508.
- c. Tracking and Data Acquisition Handbook for the Spaceflight Tracking and Data Network, 531-TAH-STDN.
- d. Network Logistics Manual, STDN No. 507.

5. RESPONSIBILITIES:

a. DFRC

- (1) DFRC will provide SSP mission support, as scheduled, via the DFRC Range Control Office (RCO).
- (2) DFRC will provide SSP S-band downlink (STDN/Tracking Data Relay Satellite System (TDRSS) mode) network support for the following mission phase
 - (a) Launch and Early Orbit.
 - (b) Orbital - Contingency Support.**
 - (c) Orbital - Prelanding Support.

- (d) Deorbit, Entry, and Landing.
 - (e) Postlanding.
- (3) DFRC will provide SSP S-band uplink network support for the following mission phases:
- (a) Landing - 20K feet altitude to touchdown and rollout.
 - (b) Postlanding.
 - (c) Contingency or Emergency (best effort) for:
 - 1. Abort Once Around (AOA).
 - 2. Landing Opportunities.
 - 3. Orbital.
 - 4. DeOrbit, Entry, and Landing.
- (4) DFRC will provide operators for the SSP Shuttle S-band Forward Link (SFL) to permit 24-hour day coverage of the Space Shuttle Orbiter as required for the post-landing network support.
- (5) DFRC will operate, maintain, and install Engineering Changes (EC's) as required.
- (6) DFRC will maintain configuration control of the S-band exciter and transmitter system and will coordinate, with GSFC, any planned changes or modifications to the S-band system that may affect Space Shuttle support.
- (7) DFRC will provide sustaining engineering, modifications, and spares for the DFRC-provided systems and the GSFC-provided exciter and transmitter.
- (8) DFRC will utilize the 501-601/Space Shuttle to ensure that site configurations and operational procedures are correct, as documented, and that they represent the operational systems to be used to support SSP missions.

- (9) DFRC will support verification and validation testing. All changes to software or hardware which affect the network or Orbiter interfaces will require verification testing and may require validation testing with the Johnson Space Center (JSC), in accordance with the governing verification/validation testing documentation.
- (10) DFRC will requisition spares or replacement parts or items for equipment provided by GSFC through the existing GSFC Logistics Support Depot (LSD) system using established procedures for requisition processing, priority assignment, and status reporting contained in STDN No. 507.

b. GSFC

- (1) GSFC will provide STDN documentation required to operate and maintain GSFC-furnished equipment, except for the unique S-band exciter and transmitter.
- (2) GSFC will provide the STDN operations documentation (i.e., 501-601/Space Shuttle, 531-TAH-STDN, etc.) required to support SSP missions.
- (3) GSFC will provide EC's and EC kits for the GSFC-furnished equipment (except for the unique S-band exciter and transmitter) to ensure commonality and compatibility with other similar equipment used throughout the STDN Ground Network (GN).
- (4) NASA/GSFC LSD will provide unique spares and contractor technical maintenance repair services in support of ground station equipment provided by GSFC.
- (5) GSFC will provide a copy of STDN No. 507, which contain procedures to utilize the LSD system.
- (6) GSFC will provide Nascom support for telemetry, command, voice, video (television), and teletype communications between GSFC and DFRC.
- (7) GSFC will provide engineering assistance, if required, to ensure that GSFC furnished equipment and modifications perform as planned for SSP mission support.
- (8) GSFC will include DFRC in the scheduled network simulations, missions, and Simulation Operations Center (SOC) training activities used to maintain network operations proficiency.

6. MANAGEMENT INTERFACES

Each center will identify an Office of Primary Responsibility (OPR) as the principle point-of-contact for coordinating the implementation associated with this MOA.

a. DFRC

Range Operations Branch (XFR)
Research Facility Division (XF)
Edwards, CA 93523-5000

b. GSFC

Flight Mission Support Office (Code 501)
Goddard Space Flight Center
Greenbelt, MD 20771

GSFC exercises its technical and operations management through the Network Support Committee (NSC), chaired by the Flight Mission Support Office (Code 501). The DFRC agrees to actively participate in the NSC.

- c. Each center will notify the other of any changes in the offices responsible for overall management.
- d. The functional responsibilities of the designated OPR'S and their parent institutions include, but are not limited to, planning, requirements, integration, installation, test, configuration control, operations, maintenance, and training.

7. EQUIPMENT TRANSFER

Upon implementation of this Agreement, GSFC will reassign other equipment as required for NASA T&DA support.

8. FUNDING

Both parties agree to conduct their respective responsibilities with regard to this MOA at no cost, to the other party.

9. ADMINISTRATION

- a. This Agreement shall become effective on the date of the last signature affixed to this MOA. This Agreement may be modified at any time upon written approval of both GSFC and DFRC.

- b. This Agreement supersedes and deletes the Letter of Agreement Between the Mission Operations and Data Systems Directorate, Goddard Space Flight Center and the Dryden Flight Research Facility's Ames Research Center for Providing Tracking and Data Acquisition Network Support to the National Space Transportation System, dated September 21, 1991.
- c. This Agreement shall be reviewed biennially and as required by both GSFC and DFRC to determine the need for continuation, modification, or termination.
- d. The termination of this Agreement shall be 6 years from the date of the last signature affixed to this MOA, unless extended in writing by mutual consent of both parties. This Agreement may be terminated at any time by mutual consent of both parties or by either party with at least a 180-day advance written notice.